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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/085,204 | 02/26/2002 | Takuro Sekiya | 220103US2 | 8688 |
| 22850 | 7590 | 03/17/2004 | EXAMINER | |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | MENEFFEE, JAMES A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2828 | |

DATE MAILED: 03/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/085,204

Applicant(s)

SEKIYA ET AL.

Examiner

James A. Menefee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-62 is/are pending in the application.
- 4a) Of the above claim(s) 9-62 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Paul J
PAUL JP
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 20030612 6) ☐ Other: _____

20030520

DETAILED ACTION

Response to Amendment

In response to the amendment filed 8/29/2003, the specification and claims 1, 6, 9, 16-18, 24, 28, and 35-51 are amended. Claims 1-62 are pending.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Election/Restrictions

Claims 9-62 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the paper filed 8/29/2003.

Applicant is reminded that if applicant decides to cancel claims to a non-elected species, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Specification

The lengthy specification and the drawings have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in

correcting any errors of which applicant may become aware in the specification or drawings.

Note also that the examiner has noticed numerous instances where the term “im” is used to represent micrometers. These should be changed to “ μm ”.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation that the thickness of the material layer is less than $(50\lambda - 15)$ nm, where λ is the tuning wavelength of the DBR. However, it is not clear what thickness the applicant desires. From earlier in the claim, λ is at least $1.1 \mu\text{m}$, which is 1100 nm. Since the result is in nanometers, then the relevant variable must be in nanometers. Thus, this formula will amount to at least $50 \times 1100 - 15$ which is at least around 55000 nm. This is a large deviation from what is claimed elsewhere, and it is believed that the formula should instead read less than $(0.05 \lambda - 15)$.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohiso et al. (US 5,864,575). See especially col. 3 line 42 – col. 4 line 18, Figs. 5A, 9A and the discussion thereof, and claims 1-2.

Regarding claims 1-3 and 6-8, Ohiso discloses a DBR comprising a first semiconductor layer having a first refractive index, a second semiconductor layer having a second refractive index lower than the first refractive index, the semiconductor layers being alternately stacked. There is a material layer between the first and second semiconductor layers having a third refractive index intermediate between the first and second refractive indices. The DBR is tuned to 1.55 μm , which is a wavelength greater than 1.1 μm . The material layer (col. 4 lines 13-18, claim 2) is disclosed as having a thickness less than that of the semiconductor layers. The semiconductor layers have a thickness of $(1.55 \mu\text{m} / 4n)$; the refractive indices of these layers will be around 3 to 4 (depending on Al content) and thus the thicknesses of the semiconductor layers should be around 95-130 nm. Thus, the thickness of the material layer must be less than 95-130 nm. In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Thus, there is a *prima facie* case of obviousness for the thickness of the material layer in the ranges claimed by applicant, since the claimed ranges lie inside the range of less than around 95-130 nm.

Regarding claims 4-5, Ohiso discloses the semiconductor layers may be AlGaAs layers having different Al and Ga compositions. The range for the Al in each is between 0% and 100%. Thus, the difference in Al content that is claimed in these claims is met by the disclosure, as the

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AI content in each may be somewhere between 0 and 100% such that the AI content is as claimed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Jewell et al. (US 4,949,350) also shows a DBR having a material layer disposed between semiconductor layers similar to the claimed invention (see fig. 2).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (703) 605-4367. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Due to the USPTO move, Examiner Menefee's and Supervisor Ip's telephone numbers will change in January 2004 to (703) 272-1944 and (703) 272-1941 respectively.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



JM
December 29, 2003



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